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# BUSHELS TO HUNDREDWEIGHTS

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Because of the interest shown in the series of articles on the proposed change from the bushel to the hundredweight unit of measurement, which has appeared in the Searle Grain Company "Grain Market Features" Letter, it was decided to reprint these in pamphlet form.

This whole question is at present being investigated by the Statistics Branch of the Board of Grain Commissioners for Canada, Winnipeg, to whom comment and inquiries may be directed.

**Searle Grain Company, Limited**

WINNIPEG

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# BUSHELS TO HUNDREDWEIGHTS

## *How the Matter Stands*

Until recently, not too much had been heard of the proposal advanced some years ago that it would be desirable to change the basic unit of grain measurement in the Canadian grain trade from the bushel to the hundredweight. Now, with the presentation of its findings to the Committee on Western Grain Standards, the Statistics Branch of the Board of Grain Commissioners for Canada, has again brought this whole question very much to the fore. As a result, an effort is being made to determine the extent of support among farmers and others, as well as to study the various problems that would be involved in making the change. Giving added weight to the proposal is a strong parallel move in the U.S.A. which, supporters hope, will bear fruit by 1958. Stressed by those advocating the change is the fact that the bushel as a unit of measure is cumbersome and out-of-date and of no real use in determining the value of grain. Far better, it is thought, with other farm commodities marketed on the pound, hundredweight, or ton basis, to adopt a uniform and convenient basis for the marketing of grain as well, thereby greatly simplifying calculations required as well as eliminating the necessity for numerous conversions and reconversions during the marketing process.

### A BREAK WITH TRADITION

There is good reason to believe that many Canadian farmers, feed dealers and others, would be receptive to the proposed change and, in fact, would welcome it, although, as always, any break with tradition is bound to meet with a certain amount of opposition. Deep rooted customs or systems die hard, despite the best and most logical reasons which may be advanced for their discontinuance. That is why in the field of weights and measures there are so many different standards still in use in various parts of the world and why so many terms which have largely lost their meaning in the larger commercial field still persist in many out-of-the-way and small local markets, particularly in the old world. In Continental Europe, during the period of recorded history, for instance, the number of different units of weights and measures that were used amongst the various peoples runs into the hundreds as regards names and into thousands as regards appreciably different values. Yet it was the old world which, through the action of The New French Republic in 1795, gave the lead in bringing about a much needed change to a decimal or metric system. One country after another has since voluntarily adopted the change to the new system and today more people both in Europe, as well as in many other parts of the world, express their concept of distance and mass in metric units than in any other way. This change, always effected at appreciable inconvenience and expense, was made for the sake of greater simplicity.

### THE ULTIMATE GOAL?

In contrast to the fairly universal use of this simpler system of measurement only the English speaking peoples, among the progressive nations, have continued to use what has been described as "a conglomeration of accidents sanctified by custom". Irrelevant as it may seem, therefore, to a discussion of bushels or hundredweights, the metric system is important because it scientifically integrates all measures of length, volume and weight and there are many who feel that the ultimate adoption of anything less than this, in a world that is fast becoming international in outlook, would be a mistake. Its universal acceptance may be a dream that will not be realized, in our time, if ever, but the fact remains that the metric system is legalized and stands ready to be used in the two main areas, the United Kingdom

and North America, where, at the present time, it has only a very limited application—mainly scientific. Actually the move that is now being suggested would go only part way, along another route, but the end result would be very much the same in that it would at least place unit of measurement for grain on a decimal basis. By so doing, it would satisfy the present demand in North America for a simpler system.

In this series of articles we shall attempt to give something of the background of our present bushel measure and to show its relationships with other measures commonly used elsewhere in the handling of grain. Also discussed from the standpoint of the farmer, the feed dealer and the trade, will be some of the problems now encountered in the handling of grain and the improved situation that might result from the substitution of the hundredweight measure for the bushel.

## *The Bushel*

Since it is the 'bushel' that we may be discarding in the Canadian grain trade, at some time in the future, it may be interesting to review some of the facts respecting this historically important unit which has been used as a measure of volume from very early times. Indeed, so ancient is the usage of the bushel that it is difficult to discover too much about it. It is known, however, that the bushel was used in the old world, for a good many centuries, for measuring corn. The word itself traces back to a medieval Latin 'Bustellus' or 'Bussellus' (a little box) which implies a measure of volume. In general use for most products is the 'struck' or measured level bushel; but in some regions, including parts of the U.S.A., a heaped measure is still used for some articles such as apples. However the important thing to recognize is that, heaped or level, the bushel has always been essentially a measure of volume.

### THE BACKGROUND

The background of our present bushel lies in the two standard bushels which have been in effect in the English speaking world during fairly recent times. For many years the 'Winchester' bushel of 8 gallons, or the volume of a cylinder 18½ inches in diameter and 8 inches in depth and containing 2150.42 cubic inches, was the standard 'corn' bushel in England, although it is interesting to note that the old Scottish bushel for barley and oats, a 'firlot', equalled 1½ Winchester bushels. Then, in the year 1826, the 'Imperial' bushel of 2219.6 cubic inches was legally established in Britain and it is this standard which Canada uses. The 'Winchester' bushel on the other hand, introduced into the U.S.A. during colonial days, has remained in use there. Thus on the North American continent we have two distinct bushels one of which, the Imperial, is approximately 3% larger than the other.

But to return to the Canadian situation. Here, under our present system, we in a sense, also have two bushels. (1) a volume bushel and (2) a weight bushel. In other words, while basically a bushel is a measure of volume, we have created unit measures of weight called 'bushels' as well, at some time in the past official standard weights per bushel of 60 pounds in the case of wheat, 48 pounds in the case of barley, etc., having been established for the different kinds of grain and for other products. It is these bushels, so-called, which will disappear and cease to have any meaning if we adopt the straight hundredweight basis.

### WEIGHT PER BUSHEL AND QUALITY

In another area, our grading system, the weight per bushel is, of course, one very important indication of quality. That is why the Canada Grain Act requires that each of the statutory grades of grain must weigh a minimum of so many lbs. per measured bushel. In this area, the Inspection Branch of the Board of Grain

Commissioners uses the measure in its strictest sense and weight per measured bushel is determined accurately; but this is not the bushel the elevator agent talks about which is based on a fixed number of lbs. of wheat or other grains. Because the taking of the weight per measured bushel is considered an essential operation in quality determination and grade definition, the use of the bushel for this purpose, is not likely to be affected by any other changes which might be made. Under such circumstances, the term 'bushel' might eventually be confined solely to the "weight per measured bushel" as provided for in the Canada Grain Act.

### OTHER WORLD UNITS IN THE MEASUREMENT OF GRAIN

Thus far we have dealt with the bushel proper in the various senses in which the term is used but in order to compare it with other present standards of weight—for it is in the direction of weights that we are now moving—it will perhaps be useful to review these very briefly as well. Although we in Canada adhere very closely to the Imperial system of weights and measures, including the imperial bushel, we do use the 100 lb. cwt. (defined in the Canada Grain Act as the 'Cental') and the 2000 lb. short ton. These weights are in contrast to the 112 lb. cwt. and 2240 lb. long ton used in Great Britain, Australia, New Zealand and most other Commonwealth countries. One of the exceptions, South Africa, also uses the short ton, while wheat is sacked in 200 lb. bags. Another, the Channel Islands, employs two different hundredweights, the one of 112.3 lbs. and the other of 108.9 English lbs. The United Kingdom measures themselves are broken down into 'quarters' and to make matters a little more confusing, the quarter in the United Kingdom may mean either  $\frac{1}{4}$  of the 112 lb. cwt. (28 lbs.) or, more commonly in grain handling, a measure of 8 bushels. Even that is not quite correct for home grown barley and malting barley are based on 448 lbs. to the quarter whereas imported feed barley is based on 400 lbs. The same thing applies to wheat, homegrown wheat being based on 504 lbs. to the quarter and imported wheat on 480 lbs., an even 8 bushels on the basis of 60 lbs. per bushel. Here in Canada, a recent forward step, in line with the present proposal, was the adoption of the 100 lb. sack of flour in place of the old 98 lb. bag. In Britain, however, a sack of flour still weighs 280 lbs. or 20 stone. There too, while the 'cental' was introduced into the Liverpool corn market as early as 1859 and while quotations were, for a time, based on the cental when the Liverpool market reopened a few years ago, it has apparently since been discarded, all quotations now being on the basis of the ton.

It is easy to see from the foregoing just where we in Canada stand in the matter of commercial weights and measures used in the grain business. For the time being, at least, there is no thought that we should align ourselves with the metric system. We are linked with the British Imperial system of weights and measures but are sufficiently independent through the use of the 100 lb. cwt. and the 2000 lb. ton to overcome the few remaining hurdles which now stand in the way of adopting a decimal basis throughout. One of these, but not the only one, is the proposed elimination of the bushel.

### *What the Proposed Change Would Mean*

At this point we shall attempt to review very briefly some of the ways in which farmers and others who handle their grain would stand to be affected if the hundred-weight were eventually substituted for the bushel as the basic unit of measurement in the grain trade. Some of the advantages claimed, particularly from the standpoint of necessary calculations and the keeping of records, are quite apparent but not overlooked by those who support the change, is the fact that certain disadvantages, to be mentioned later, must be seriously considered before such a step is taken. Thus the need to proceed slowly and carefully.

## FROM FARM TO SEABOARD

Without attempting to give an exhaustive analysis of the situation, some of the drawbacks to our present system will perhaps be best understood if we attempt to trace the various procedures followed from the farm where the grain is raised to the ocean vessel which carries it to its ultimate destination. Having seeded his crop at so many bushels per acre and having calculated his yields on the same basis, the farmer, at harvest time, draws his load of grain to the elevator, paying the trucker, if any, by the bushel. Here it is weighed on the elevator scale in lbs., although the storage receipt or cash ticket he receives is issued for so many bushels. The elevator agent later proceeds to ship a car of grain from the elevator and this time, to complete his shipping report, he has to convert the grain shipped, weighed in lbs., to bushels. Thus his shipping report is expressed in bushels, whereas the railway bill of lading is expressed in lbs., all freight charges, of course, being expressed in so many cents per hundred lbs. The grain proceeds to the terminal or mill where it is weighed in lbs. and then converted to bushels by both the elevator company and the Board of Grain Commissioners independently. Later, the terminal is required to ship out so many bushels. Once again, two conversions are required. The first, a conversion of the order from bushels to lbs. for the weighman; and second, a reconversion to bushels for documentation. Lake bills of lading are made up in bushels, the grain being unloaded at transfer points or at seaboard in lbs. and once again being reconverted to bushels. The grain is ultimately loaded on the vessel in lbs., the equivalent ton weight being shown either in metric or long tons, depending on the destination. Ocean freights are generally calculated on the basis of the hundredweight or ton and from this stage on, to all intents and purposes, everything is calculated in tons rather than in bushels.

## OTHER SITUATIONS

So much for the straight 'run' of grain from the farm to the ocean-going vessel but what of the special jobs that frequently have to be done either by the elevator agent or someone else somewhere along the line. If, for instance, an elevator operator cleans grain covered by storage receipts, he must convert the weight of the cleaned grain which he weighs in lbs., into bushels. Where an elevator operator makes a local sale of grain, too, he must first convert the order from bushels to lbs. in order to know how much grain he must weigh out in lbs. and after he has weighed out the grain, he must reconvert the lbs. to bushels to complete the sales invoice. Again when cut-offs are made, all weights are first made in lbs. and then converted to bushels. The same thing applies when terminals are weighed up. At times, when any grain has to be cleaned or out-of-condition grain is treated, there is also a double conversion from bushels to lbs. and from lbs. back to bushels again. Still again, in the calculation of dockage, the percentage is at present taken on the bushel figure, although the grain is originally weighed in lbs. — the latter a much simpler basis of calculation for the agent and one that would be more easily followed by the farmer customer at the time of the delivery.

## SOME CONSIDERATIONS FROM THE FARMERS' STANDPOINT

So we might continue but enough has been said, no doubt, to indicate the many opportunities that exist for the elimination of numerous conversions, as well as other calculations and bookkeeping entries, all of which present opportunities for mistakes and all of which consume both time and money. From the farmer's standpoint, in any of the operations mentioned where he is directly concerned, the whole procedure, if figured on a uniform and convenient decimal basis, related to lbs. or hundredweights would mean the simplification of price and cost calculations. The farmer as a feeder, too, should gain through easier comparison of feed ratios and

cost. As it is, with weights per bushel varying from commodity to commodity, the job of mixing rations and of comparing feed values of different grains, is somewhat complicated. On the bushel basis, comparison of the feeding value of oats at say 65¢ per bushel now has to be made with barley at say 90¢ per bushel. On a hundred-weight basis, comparing 100 lbs. of the one feed with 100 lbs. of the other would show a value of \$1.91 for oats as against a value of \$1.87 for barley, or so many cents per lb. in each case. Some have expressed the view that farmers might find it difficult to change from bushels to hundredweights but if anything, the reverse seems likely to be the case. Many of our farming population in the old lands from which they came were, in fact, brought up to use the metric system of weights and measures with which they are thoroughly at home. Rather than finding the suggested decimal basis difficult, therefore, they would be more likely to take to it readily. The full extent of farmers' support for the suggested change has still to be determined but a definite share of the support to date appears to have come from the farmers in their district organizations. This, then, may be taken as a fairly good indication of what they are thinking about the matter.

### *Some of the Problems*

Even the most ardent proponents of the proposed change from the bushel to the hundredweight basis, recognize that there would be certain disadvantages, many of which, perhaps, would ultimately disappear. Among the latter would be: (1) the complete change in thinking that would be required and that would take sometime to bring about, (2) the complete change in forms, documents and office equipment that would be needed and (3) the setting of a whole new body of competitive, historical, statistics to take the place of existing records.

#### THE PROPOSAL MUST BE GENERALLY ACCEPTABLE

Aside from the change in thinking which would have to be a gradual process — so accustomed have we become to thinking relative to yields, prices, storage etc. in terms of bushels — the other considerations involve a change of some magnitude which might affect some segments of the grain industry more than others. Any appraisal of the plan, therefore, would have to weigh very carefully possible benefits against the somewhat costly changeover required and the inconveniences or drawbacks, temporary and otherwise, which might result from a change to the hundredweight basis. In other words, would the move be warranted not only from the standpoint of the farmer, country elevator agent and the feed dealer most of whom would undoubtedly favour its adoption, but also from the standpoint of the trade and the grain industry as a whole? This is a question that we cannot attempt to answer but before we leave the subject mention must be made of at least two other considerations that are tied in very closely with the proposal.

#### OF MAJOR CONCERN

Without a doubt, the question that is causing most concern to proponents of the hundredweight standard of measurement is what to do about storage capacities — a cubic problem that would seem to call for special treatment. A bushel, by Canadian standards, is defined as a dry measure containing 2219.6 cubic inches or the equivalent of approximately 1.28 cubic feet. In other words, an elevator will hold close to 80% or four-fifths as many bushels as there are cubic feet of storage space provided. On the basis of the official weights per bushel, wheat 60 lbs., barley 48 lbs., and so on all these grains now occupy approximately a bushel o space. In other words, aside from any variation there may be in test weight, there is at

present a close correlation between bushels and space requirements, regardless of the kind of grain stored. Should the hundredweight unit be adopted, however, no such correlation would exist for the reason that, once translated into hundredweights the resulting units would have no common denominator as related to capacity. The hundredweight of wheat and oats would weigh the same but the one would require 1 2/3 bushels of space and the other almost 3 bushels of space. Thus, rating an elevator at so many hundredweight capacity would have little meaning without a necessary conversion table which would give the equivalent in bushels. Under these circumstances, we would be back where we started — with bushels. An alternative, presumably, would be to establish storage capacity on a 'cubic feet' basis which would, as already pointed out, closely parallel the bushel. If this were done it would be relatively easy to change one's thinking, substituting cubic feet for bushels but there would still be the problem of the different kinds of grain occupying different amounts of space per 100 lbs. or hundredweight.

#### OTHER AREAS AFFECTED

Another area that would be affected, of course, is that related to storage charges, now set at so many cents or fractions of a cent per bushel per day in the case of each of the various grains. On a hundredweight basis, these would have to be adjusted accordingly and such adjustments might present some problems.

Again, quotations on the Futures Markets are at present all on the bushel basis and for some reason or other, which has never been explained, these are shown in eights of a cent per bushel rather than in tenths. Changing the basis of quotations from bushels to hundredweights might prove somewhat cumbersome to all but feed dealers who are used to thinking in terms of 100 lbs. and tons. However, should the change to hundredweights be accepted, in so far as it would apply to quotations it would seem that this might be an opportune time to go one step further and to get rid of 'eighths' placing all quotations on the basis of "tenths" which would be in line with the attempt that is being made to decimalize our present system. Yet here again, there may be much difference of opinion.

#### SOME CONCLUSIONS

In our series of articles on this matter, we have attempted to present as many as possible of the facts although we realize that our treatment of the subject must necessarily be incomplete. Undoubtedly, if anything is to be achieved in this direction it will be a matter of proceeding slowly and carefully. Many angles must be considered and it will take time for all who are concerned to secure all the facts. Even then, and assuming that the move eventually meets with sufficient support, the change is not likely to come about overnight. Officially, some indication of the Government's attitude towards the proposal may be had from a recent statement by the Minister of Trade and Commerce in the House of Commons. After observing that his department was continuing to watch the development of this proposal, Mr. Howe stated:

"It is hardly the function of the government, on its own initiative, to change a form of measurement that has always been in force in Canada, but if we are satisfied that it is the unanimous wish of those who produce and handle grain in this country that the basis of measurement should be changed along such lines, the government will give serious consideration to taking appropriate action."

